United Nations

FCCC/SBI/2014/INF.20/Add.2

Framework Convention on Climate Change

Distr.: General
24 November 2014

English only

Subsidiary Body for Implementation
Forty-first session
Lima, 1–8 December 2014

Item 3(b) of the provisional agenda
Reporting from and review of Parties included in Annex I to the Convention
Compilation and synthesis of sixth national communications and first biennial reports from Parties included in Annex I to the Convention

Compilation and synthesis of sixth national communications and first biennial reports from Parties included in Annex I to the Convention

Note by the secretariat

Addendum

Vulnerability, impacts and adaptation; research and systematic observation; and education, training and public awareness

Summary

This document contains the second part of the compilation and synthesis of the sixth national communications and first biennial reports submitted to the secretariat by Parties included in Annex I to the Convention. It provides information on a range of issues relating to the implementation of the Convention, such as: vulnerability assessment, climate change impacts and adaptation measures; research and systematic observation; and education, training and public awareness.

GE.14-22680 (E)

1422680

Please recycle

Contents

		Paragraphs	*Page*
I.	Introduction	1–2	3
II.	Vulnerability assessment, climate change impacts and adaptation to climate change	3–35	3
	A. Overview	3–4	3
	B. Impact and vulnerability assessment and adaptation measures being undertaken by Parties	5–29	4
	C. National adaptation strategies, policies, plans and proposed measures	30–33	11
	D. Emerging trends and international cooperation	34–35	13
III.	Research and systematic observation	36–64	14
	A. Overview	36	14
	B. General policies and funding	37–41	15
	C. International and regional cooperation, including capacity-building	42–48	16
	D. Research	49–54	17
	E. Systematic observation	55–64	19
IV.	Education, training, public awareness, public participation, public access to information and international cooperation (Article 6 of the Convention)	65–83	21
	A. Overview	65–67	21
	B. Education and training	68–73	22
	C. Public awareness, public participation and public access to information	74–80	23
	D. International cooperation	81–83	25

I. Introduction

1. The 2014 compilation and synthesis of the sixth national communications (NC6s) submitted in accordance with decisions 9/CP.16 (under the Convention) and 10/CMP.6 (under the Kyoto Protocol) and the first biennial reports (BR1s) submitted in accordance with decision 2/CP.17 consists of three separate documents. The main report, which includes information on all reporting elements following the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines on NCs) and the "UNFCCC biennial reporting guidelines for developed country Parties" (hereinafter referred to as the UNFCCC reporting guidelines on BRs), is published in two separate parts: part one, presented in document FCCC/SBI/2014/INF.20/Add.1, contains a synthesis of the reported information on national circumstances, greenhouse gas (GHG) inventories, emission projections, quantified economy-wide emission reduction targets and progress made in their achievement, policies and measures, and the provision of financial, technological and capacity-building support to developing country Parties; and part two, presented in this document, contains a synthesis of the reported information relating to vulnerability assessment, climate change impacts and adaptation measures, research and systematic observation, and education, training and public awareness. An executive summary is contained in document FCCC/SBI/2014/INF.20. All references to Parties in these documents are to Parties included in Annex I to the Convention (Annex I Parties), unless otherwise indicated.

2. This compilation and synthesis report for Annex I Parties includes information from NC6s and BR1s submitted by 31 March 2014. It includes information from all 43 Annex I Parties (42 countries[1] and the European Union (EU)) and from Kazakhstan.[2]

II. Vulnerability assessment, climate change impacts and adaptation to climate change

A. Overview

3. Annex I Parties provided, in their NC6s, information on vulnerability assessment, observed and expected impacts of climate change, national adaptation policies and legislative frameworks, and subsequent adaptation measures undertaken as well as planned.

4. Similar to in the fifth national communications (NC5s), concrete and practical examples of actions taken across vulnerable sectors were provided, as well as more advanced information on research efforts in relation to adaptation. Parties' current adaptation efforts are generally building on past and ongoing adaptation initiatives, clearly demonstrating that adaptation is a continuation of efforts based on ongoing learning. Many Parties see climate change adaptation as part of their sustainable development efforts and are increasingly mainstreaming their adaptation efforts. Some Parties reported on new

[1] This figure includes Turkey, which submitted its fifth national communication on 17 December 2013.

[2] Kazakhstan is not included in Annex I to the Convention, but in accordance with the conclusions of the Conference of the Parties at its twelfth session (FCCC/CP/2006/5), submitted its sixth national communication in accordance with Article 4, paragraph 2(b), and Article 12 of the Convention, using the UNFCCC reporting guidelines. Kazakhstan has also voluntarily undertaken additional obligations in accordance with Article 4, paragraph 2(b), of the Convention.

multilateral and bilateral development cooperation initiatives to support the adaptation efforts of developing country Parties. See box 1.

Box 1

New developments since the fifth national communications

Parties' reports suggest that, since the preparation of their fifth national communications (NC5s), adaptation efforts have been scaled up and enhanced, with an increase in the number of countries with national adaptation strategies and subsequent national adaptation plans and/or programmes. In particular, Parties reported the strengthening of their knowledge base and the increased implementation of adaptation measures at the local level. Adaptation continues to receive increased attention within the overall climate change strategies of Parties included in Annex I to the Convention, continuing the trend observed from the NC5s.

The areas and sectors most vulnerable to climate change as reported by Parties were water resources, agriculture and food security, forestry, biodiversity and natural ecosystems, coastal zones, fisheries, human health, infrastructure and tourism. The key climate change impacts of concern reported by Parties were increased extreme weather occurrences, heat and water stress, and rising sea levels and temperatures. In addition, most Parties expressed concern about emerging vulnerabilities in urban areas and in the energy and business/trade sectors.

Compared with in their NC5s, Parties provided more substantial information on national adaptation strategies, action plans and programmes in their sixth national communications. For example, Parties provided more detailed information on adaptation measures already under implementation as well as on planned measures in relation to water resources, agriculture and food security, biodiversity and natural ecosystems, fisheries, human health, forestry, infrastructure, including transport and energy systems, tourism, coastal management and protection, urban areas, including housing and construction, economy/business/industry/trade, protection from natural hazards and emergency management, disaster risk management, education, awareness raising and consumer behaviour, insurance, ensuring public safety and security, and migration.

Building on the measures reported in their previous national communications, Parties increasingly mentioned measures relating to cross-sectoral considerations and challenges, as well as those with adaptation and mitigation co-benefits. Parties also increasingly reported on efforts made to integrate and mainstream adaptation measures as part of their sustainable development efforts.

B. Impact and vulnerability assessment and adaptation measures being undertaken by Parties

5. Parties reported the use of various sector-specific models and simulation tools for climate change impact and vulnerability assessments, with examples given in table 1.

6. Having undertaken climate change impact assessments, many Parties reported increased severity and intensity of extreme weather events (e.g. flooding, storm surges and wildfires), decreased water availability, sea level rise, increased sea temperatures and intensified droughts and heatwaves as areas of vulnerability.

Table 1

Examples of models and tools used by Parties to assess vulnerability to climate change

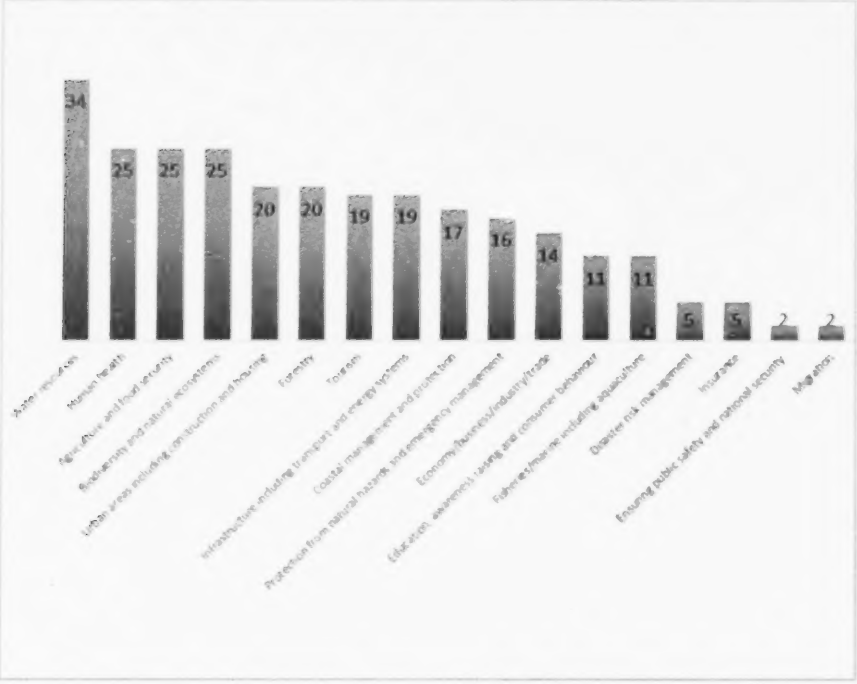
Sector	*Models and tools used*	*Party*

Sector	*Models and tools used*	*Party*
Water resources	CSIRO Murray–Darling Basin Sustainable Yields Project	Australia
	PRECIS	Cyprus
	ALADIN – CLIMATE.CZ model	Czech Republic
	ProDOC and SYKE	Finland
	KLIWAS	Germany
	Hydrodetect project	Ireland
	ECHAM5 model	Turkey
Agriculture and food security	The Climate Futures for Tasmania	Australia
	Agricultural Damages Assessment System in Crop Insurance Schemes	Belgium
	CLAVIER	Bulgaria
	ILMAPUSKURI	Finland
	CropSyst, AquaCrop and CERES	Greece
Forestry	Forest Vulnerability Assessment	Australia
	ECORISK	Belgium
	PRECIS and ENSEMBLES	Cyprus
Biodiversity and natural ecosystems	Climate Impact Profile	Australia
	The MEMO European Interreg	Belgium
	A-LA-CARTE	Finland
Coastal zones	Future Coasts	Australia
	CLIMAR and European Research Project AMICE	Belgium
Fisheries	CLIMAR	Belgium
Human health	PRECIS	Cyprus
	CTM Oslo model	Greece
Infrastructure	ACT – Climate Change Vulnerability Assessment Framework for Infrastructure	Australia
	PRECIS and ENSEMBLES prediction system	Cyprus
	ESPON CLIMATE project	Italy
Tourism	The SESAME project and the CIRCE	Italy
	Preparing the Tourism Sector for Climate Change project	New Zealand
Other	Integrated Regional Vulnerability Assessment initiative and NARCliM	Australia
	MilieuEffectRapportage	Belgium
	CYPADAPT project	Cyprus
	TOLERATE and IRTORISKI	Finland

7. Parties reported a range of adaptation measures undertaken across a range of sectors, at the national, regional and local levels, with most measures related to water resources, human health, agriculture and food security, and biodiversity and natural ecosystems. Building on the measures reported in their previous national communications, Parties increasingly reported measures of a cross-cutting nature and related challenges, as well as measures that have both adaptation and mitigation co-benefits. Parties also increasingly reported on efforts made to integrate and mainstream adaptation measures as part of their sustainable development efforts. An overview of the adaptation measures reported by

Parties in their NC6s by sector and vulnerability is shown in the figure below, with specific examples included in box 2.

Number of Annex I Parties that reported the undertaking of adaptation measures by sector/impact[a]



[a] Multiple measures may have been reported by Parties per sector/impact.

Box 2
Examples of adaptation measures undertaken by Parties

Urban areas – Belgium
The Interreg IVB project "Future Cities – urban networks to face climate change" aims to adapt city structures to inevitable climate change. Combined measures, such as energy saving, greening and bringing water into cities, reduce vulnerability (e.g. to heatwaves).

Agriculture and food security – Ireland
There are a number of Plant Genetic Resources for Food and Agriculture collections in Ireland, maintained by both public-sector bodies and non-governmental organizations. Most agricultural seeds can be stored successfully for very long periods of time in storage facilities called genebanks. The collection and preservation of such resources could make an important contribution to future crop research, both domestically and abroad.

Biodiversity – Australia
The Australian Government's Indigenous Protected Areas programme has supported indigenous communities in developing and declaring 59 Indigenous Protected Areas.

covering more than 47 million ha and contributing to landscape-scale connectivity, particularly in central and northern Australia. These large areas are managed for conservation and provide potential space for species migration influenced by climate change.

Forests – the Czech Republic

Towards building climate resilience, the updated National Forestry Programme 2013 aims to:

- Support species and ecotypes of more resilient tree populations which are able to maintain a high and stable production of wood;
- Support ecologically suitable afforestation of farming land, especially by fast-growing tree species;
- Extend statutory deadlines for afforestation and ensure tree cover in connection with the natural recovery of forests;
- Reduce soil degradation and increase the volumes of carbon stocked in soil;
- Focus subsidy rules on support to be provided for adaptation measures to reduce climate change impacts.

Coastal management and protection – Canada

Land-use planning tools have been used by several municipalities to facilitate adaptation to climate change impacts. Beaubassin-est is a small coastal community in southeast New Brunswick, vulnerable to the impacts of sea level rise and storm surge flooding. In March 2011, the Council passed an updated zoning by-law imposing stricter building requirements on developers, enhancing the protection of new constructions in the community's coastal zone and implementing a minimum height standard for buildings. The by-law identifies a sea level rise 'protection zone', in which the minimum ground floor elevation of any new building must be at least 1.43 m above the current one-in-100 year flood mark. This update to the by-law was based on the best available scientific understanding of sea level rise for the area and a high-resolution digital map that the community commissioned to help identify potential flood levels.

Coastal management and protection – the Netherlands

The Netherlands continues undertaking sand replenishment to enable the coastal foundation zone to grow concurrently with the rise in sea level. Where possible, this is to take place by naturally distributing and transferring sand along the coast. In addition, innovative solutions are being piloted to increase coastal safety by 'building with nature' or developing new multifunctional dyke concepts.

Health – Croatia

The South East European Forum on Climate Change Adaptation project, implemented by the Croatian Red Cross, with activities carried out by the Ministry of Health in cooperation with public-health institutes and the World Health Organization in Croatia, identifies measures to build the capacity of health professionals and the healthcare system, including:

- Various events held for health professionals and the public on climate change and health;
- Outreach materials distributed to the public at drugstores, health institutions and events such as World Health Day;
- Public advice published during heatwaves and distributed on the Internet and at health institutions and retirement homes;
- Announcements made by the National Meteorological and Hydrological Service warning of high temperatures and ultraviolet risk.

Water – Slovakia

The Bratislava Flood Protection System was completed in 2010 and protects citizens of the Slovak capital in the case of a momentous flood. The Flood Protection System

showed its efficiency during the June 2013 Danube flood, with 98 per cent less resulting damage than that caused by a similar flood in 2002. The System resulted in the prevention of economic and environmental damage, such as the contamination of drinking water sources in the project area, including the capital city Bratislava and its neighbouring municipalities.

The System includes:

- A new flood protection barrier in urban and suburban areas of Bratislava;
- Complete restoration (replacement and increase) of the initial flood protection line in Bratislava's Old Town;
- Increase of the flood protection barrier in the municipality of Petržalka (part of Bratislava);
- Increase of the safety of the levees on the left side of the flue channel in the Gabčikovo municipalities.

Knowledge and awareness raising for adaptation – Sweden

The Swedish Meteorological and Hydrological Institute has been running the National Knowledge Centre for Climate Change Adaptation as well as the Swedish Portal for Climate Change Adaptation (see <www.klimatanpassning.se>) since 2012. The Knowledge Centre is run jointly with other agencies and stakeholders as a resource for everyone in Sweden engaged in adapting society to climate change, compiling and disseminating knowledge and data to support decisions on and tools for climate change adaptation. The Portal contains news on adaptation impacts and measures.

1. Water resources

8. Parties reported water-related vulnerabilities, including: prolonged and increased severity of droughts; saltwater intrusion into freshwater aquifers; decreased stream flow and groundwater levels, increasing the risks of reduced water availability and supply; and observed and expected intense precipitation events, amplifying the risk of larger-scale flooding.

9. Multiple and diverse measures are being undertaken by Parties to address the increased vulnerability to climate change of freshwater resources, which are based on their regional and local circumstances, including: taking steps to manage shortages and excesses of water; and managing rainwater through storage and the use of permeable materials, including green roofs.

2. Agriculture and food security

10. Most Parties identified increasing vulnerabilities in the area of agriculture and food security in relation to heat stress, reduced water availability, prolonged and intensified droughts, altered precipitation patterns, and soil erosion, as well as outbreaks of invasive pests and diseases, having an impact on agricultural productivity.

11. Most Parties also identified opportunities that may emerge in parallel with rising temperatures and higher atmospheric carbon dioxide (CO_2) concentrations, which are favourable to longer growing seasons and increased agricultural productivity. Sweden, for example, reported that increasing CO_2 levels are expected to boost yields by approximately 5 per cent. Nevertheless, some Parties reported that any benefits expected from climate change for the sector are likely to be offset by negative impacts.

12. In response to increased vulnerability, many Parties are taking steps to diversify their agricultural systems, for instance shifting to organic agriculture and/or combining agriculture with tourism activities in order to ensure climate resilience and guarantee income-generation opportunities, as well as strengthening agricultural biodiversity.

3. Forestry

13. Assessments undertaken by Parties pertinent to the forestry sector suggest the projected migration of some tree species as well as changes in species composition driven by climatic change. For example, Poland reported that a 60 per cent species decline may occur in mountain forest populations. The assessments also suggest that forest pests, pathogens and diseases will pose an increasing threat to forest productivity and viability. Increased frequency and intensity of floods, droughts, wildfires and windthrows are also expected to affect forest health and resilience.

14. To support the adaptation of forests and forestry systems, Parties have undertaken measures such as: supporting biological productivity and ecosystem services; the prohibition of the conversion of forested land; the formation of scientific groups focusing on adaptation and forests; and increasing forested areas.

4. Biodiversity and natural ecosystems

15. Parties reported a number of climate change impacts on biodiversity in relation to periodic biological phenomena such as flowering, breeding, migration and compositional alterations to species associated with increasing temperatures, affecting their numbers and distribution patterns. Parties' reports suggest that further climate change impacts could result in an increase in invasive flora and fauna species, endangering and exacerbating the risks of habitat loss and species extinction.

16. Many Parties continued building on the adaptation measures reported in their NC5s aimed at safeguarding biodiversity towards ensuring the resilience of ecosystems and the systems that depend on them. Such measures include: supporting terrestrial and marine protected areas; retaining and restoring wildlife corridors; creating classification systems for species; supporting the retention of native genetic biodiversity; and preventing the introduction of invasive species.

5. Coastal zones

17. Climate change impact assessments reported by Parties in relation to coastal zones suggest the occurrence of shoreline recession and erosion, and encroachment due to rising sea levels and coastal inundation, as well as an increased risk of flooding caused by storm surges. Parties additionally reported exacerbated risks to coastal infrastructure such as ports and marinas, disrupting economic activities such as commercial fishing and transport. Coastal habitats and other ecosystem services are also expected to be negatively affected.

18. Diverse adaptation measures undertaken by Parties in coastal zones were reported, ranging from changing policies, plans and legislation at the national, regional and/or local levels, through managing activities in increasingly vulnerable coastal areas, including development and land-use planning, to the implementation of measures to protect coastal areas from climate change impacts.

6. Fisheries

19. Regarding fisheries, Parties reported impacts related to sea temperature rise, ocean acidification, changes in food chains, the occurrence of disease-promoting bacteria and oxygen depletion, thereby exacerbating vulnerabilities throughout marine ecosystems, driving changes in species distribution and composition and migratory patterns, and increasing niches for invasive species.

20. Adaptation measures such as safeguarding aquaculture facilities through well-informed practices (taking climatic changes and vulnerabilities into account) were reported

by Parties, aimed at enabling the adaptation of fisheries, the diversification of species grown and fished, and the installation of advanced monitoring systems.

7. Human health

21. A number of climate change impacts on human health are expected according to the information reported by Parties, including increased susceptibility to heat exhaustion, heat stroke and, in more severe cases, mortality due to heatwaves. Parties consistently identified that the elderly, children and people with existing health conditions are disproportionately at risk. Other impacts on public health, such as exacerbated allergies due to changes in the timing of pollen release, changes in the occurrence of infectious diseases (e.g. vector- and tick-borne) and adverse mental health effects driven by extreme climatic events, are also expected.

22. A number of adaptation measures have been considered or already adopted by many Parties in order to protect human health from climatic extremes, such as heatwaves and periods of extreme cold as well as extreme events. Such measures include: modifying buildings; revising regulation(s) to tackle urban heat islands; building the capacity of health professionals to provide care and relevant information in response to climatic extremes; and providing information to the general public prior and during periods of extreme heat or cold and extreme events.

8. Infrastructure

23. Parties reported that negative impacts of climate change pose risks to the infrastructure sector. Infrastructure-related vulnerabilities reported include: transportation (e.g. roads, railways, waterways and airports); buildings (e.g. housing constructions and office buildings); and coastal and energy infrastructure. The main risks already observed or expected are posed by sea level rise, the increasing frequency and intensity of storms, extreme heat, intense precipitation, flooding and strong winds. Associated economic losses incurred as a result of damage were also noted by some Parties.

24. A range of adaptation measures aimed at increasing the resilience of infrastructure in urban areas as well as of transport and energy systems were reported. In urban areas, measures taken to adapt include modifying structures and updating policies on minimum permissible building heights in areas projected to be affected by sea level rise and coastal flooding. Towards improving the resilience of transport systems, Parties have invested in increasing the adaptive capacity of railways and other transport means through the development of early warning systems.

9. Tourism

25. Many Parties addressed tourism in more depth in their NC6s compared with in their NC5s. Assessed climate change impacts on the tourism sector raised concerns in many regions in relation to: reduced snow cover; increased water temperatures, contributing to algal blooms; and damage to tourist infrastructure and attractions caused by extreme events. At the same time, potential opportunities were identified by some Parties, including reduced rainfall, prolonged tourist seasons and potential shifts in regional tourism trends and flows.

26. Parties reported adaptation measures that are planned or already being undertaken to diversify tourism opportunities in order to adapt to the changing environment, as well as adapting tourism opportunities in order to protect vulnerable ecosystems.

10. Energy

27. Considerably more Parties reported on the impact of climate change on the energy and industry sectors in their NC6s compared with in their NC5s. Increasing vulnerabilities due to rising temperatures were reported, which are expected to increase the challenges for cooling-intensive energy production and induce shifts in energy consumption and demand for heating and cooling. Economic losses due to business interruptions resulting from extreme weather events, disrupting energy supplies and resulting in lowered labour productivity and output, were also reported.

28. Some Parties have undertaken adaptive measures in the energy sector, such as: amending legislation to improve security of supply, especially during network faults in relation to extreme weather events; investing in locally generated energy and smart grids; and scaling turbines in hydroelectric power stations to better deal with expected changes in water flow conditions.

11. Urban areas, economy and trade, disasters, education, awareness raising and consumer behaviour, and enabling public safety

29. As well as the measures undertaken in relation to the sectors and impacts mentioned in paragraphs 8–28 above, as shown in the figure above Parties also reported measures undertaken specifically in relation to building resilience and reducing vulnerability in: urban areas, including housing and construction; economy/business/industry/trade; protection from natural hazards and emergency management; disaster risk management; insurance; education, awareness raising and consumer behaviour; ensuring public safety and security; and migration.

C. National adaptation strategies, policies, plans and proposed measures

30. Since their NC5s, more Parties have established or are in the process of establishing a national adaptation policy and legislative framework as a means of guiding their work on adaptation. In total, 29 Parties reported on their national strategies, plans and policies. In the majority of cases, national adaptation planning efforts have been undertaken to provide strategic and operational direction to medium- to long-term adaptation initiatives. Consequently, many Parties have developed a national adaptation strategy, with several including national adaptation plans or programmes. In general, national adaptation strategies result from broad stakeholder participation and endorsement at the national and subnational levels and across sectors.

31. In some countries the mandate for the national adaptation plan(s) or programme was established through a long-term legally binding framework, such as: the United Kingdom of Great Britain and Northern Ireland's Climate Change Act, adopted in 2008; the Swiss revised CO_2 Act; and, in the case of the United States of America, an Executive Order and a Presidential Climate Action Plan. Several EU member States indicated that their national actions originated from relevant EU legislation on adaptation. In Switzerland the responsibility for addressing climate change adaptation is set out in the Constitution of the Swiss Confederation, in which sustainable development is listed as one of the country's main objectives. The information provided by some Parties indicates that the process of developing their national adaptation plans has taken, on average, four to five years. It is an iterative process and the revision of those plans is planned to take place, in most cases, every five years. See box 3 for examples of regional and national adaptation strategies and plans.

Box 3

Synergies between regional and national adaptation strategies and plans: the case of the European Union and its member States

In April 2013 the European Union (EU) developed a strategy on adaptation to climate change. The strategy is based on the 2007 EU Green Paper entitled "Adapting to climate change in Europe – options for EU action" as well as on the 2009 EU White Paper entitled "Adapting to climate change: Towards a European framework for action", which is a key policy document for climate adaptation at the EU level. The EU strategy has been informed by the European Climate Adaptation Platform, Climate-ADAPT, a programme established in 2012 to address knowledge gaps by providing resources and tools to support adaptation policy and decision-making.

One of the main objectives of the EU strategy on adaptation to climate change is the promotion of actions undertaken by member States for the development of comprehensive adaptation strategies at the local, regional and national levels. Several EU members States have developed a national adaptation strategy and/or plan, guided by the EU strategy and the Green and White Papers. This is the case of the three countries presented below, namely Cyprus, France and Poland.

Cyprus has developed a national strategy for adaptation to the adverse impacts of climate change. The strategy includes: a description of climate change impacts already occurring and an estimate of potential future climate change impacts; an assessment of the vulnerability of different systems, main sectors and communities to the risks of climate change; and an assessment of adaptive capacity and opportunities associated with climate change; and it proposes immediate adaptation actions.

France published its national adaptation plan in July 2011. The plan is based on scientific information and recommendations from public consultations. It includes 84 actions that roll out into 240 measures to be implemented between 2011 and 2015, covering 20 themes such as health, water, biodiversity, etc. Through the DRIAS[a] portal, France provides public access to regional French climate scenarios on the impacts of climate change, together with adaptation options.

Poland is in the process of developing a strategic adaptation plan for the 2020 time-horizon and beyond, which should drive adaptation efforts in the sectors most vulnerable to climate change, including: agriculture and rural areas; water resources; coastal and marine zones; public health; flora and fauna; and infrastructure.

[a] DRIAS = Donner acces aux scenarios climatiques Régionalisés français pour l'Impact et l'Adaptation de nos Societes et environnement. See <www.drias-climat.fr>.

32. Parties' national adaptation strategies, policies, plans and programmes tend to focus on sectoral issues, in particular by addressing the needs of the main sectors affected by climate change, but also on cross-sectoral and thematic issues, such as urban areas and agroecological zones. In several countries, such as Germany, United Kingdom and United States, the national strategy also sets out the country's international responsibility for adaptation to climate change. In the case of most countries, the national adaptation plans and programmes are an extension of the national adaptation strategies. They provide a set of actions and measures, including for addressing gaps in knowledge and providing sound scientific information.

33. In most cases, the development and coordination of national adaptation frameworks is the responsibility of a national institution or agency or is shared among several government institutions. Actual implementation of measures within such frameworks tends to occur at the local or municipal level. To that end, Parties reported many measures,

ranging from regional to local initiatives, in many shapes and forms, from the modification and development of legislation, establishing scientific and advisory bodies, enabling the sharing of information and best practices, awareness raising and training, to engineering and infrastructural changes in response to climate change impacts and vulnerability. Although most measures are undertaken at the sector level, some measures are cross-cutting, for instance the Danish Action Plan for a Climate-Proof Denmark provides a cross-cutting overview of the initiatives that the Government has either planned or already set in motion towards achieving climate resilience, including a Portal for Climate Change Adaptation.

D. Emerging trends and international cooperation

1. Trends

34. Parties reported on vulnerabilities, impacts and adaptation measures in new sectors and/or increased their focus on specific sectors, including tourism, energy and industry. They are also tending to report on adaptation initiatives related to urban areas more than in the past. Similarly, Parties increasingly mentioned measures relating to cross-sectoral considerations and challenges, as well as those with adaptation and mitigation co-benefits. This trend is particularly visible in relation, but not limited, to the agriculture sector. For example, in Norway "Cities of the Future" is a collaborative programme between the Government and the country's 13 largest cities, which is aimed at reducing GHG emissions and adapting to the changing climate. Parties' reporting indicates an increased number of countries that have developed national adaptation strategies, with many extending their strategies to develop national adaptation plans and programmes. Parties' current adaptation efforts are generally building on past and ongoing adaptation initiatives, demonstrating clearly that adaptation is taken by all as a continuum. Many Parties are addressing climate change adaptation as part of their efforts towards achieving sustainable development. At least one Party (Turkey) is taking action to address climate-induced domestic displacement.

2. Cooperation

35. All Parties are engaged to various degrees in international cooperation in preparing for adaptation. The majority are taking advantage of opportunities at the international level for addressing climate-science research and knowledge gaps. In addition, many Parties provide technical, financial and capacity-building support to developing countries. Such support materializes through financial contributions to international funds (e.g. the Global Environment Facility, the Least Developed Countries Fund, the Special Climate Change Fund and the Adaptation Fund) or other types of multilateral cooperation. Many Parties are also very actively engaged in bilateral cooperation. See box 4 for examples of international cooperation.

Box 4
Examples of international cooperation

Climate policies and services

There is effective, binding international cooperation in the Arctic region, which promotes environmental protection and sound resource management. The Arctic Council is the most important arena for dealing with common challenges in the Arctic. It has published a number of reports that synthesize and assess new knowledge on climate change in the Arctic.

In addition, the Barents Euro-Arctic Council is a cooperative initiative in the Barents Euro-Arctic Region, with members from Denmark, Finland, Iceland, Norway,

Russian Federation, Sweden and the European Commission. The Council is about to adopt a Climate Change Action Plan for the Barents Cooperation, in which adaptation to climate change features as one of the four main policy areas. Relevant adaptation measures will be suggested.

Bilateral cooperation – Germany

Germany's provision of support to developing countries to adapt to climate change is one of the four pillars of the German Strategy for Adaptation to Climate Change, which was adopted in 2008, and its subsequent action plan, adopted in 2011. In addition, Germany's federal Government considers climate change to be a cross-cutting issue for German development cooperation.

III. Research and systematic observation

A. Overview

36. Research and systematic observation activities were reported by all Annex I Parties. Most Parties generally followed the UNFCCC reporting guidelines on NCs in the part of their NC 6s on research and systematic observation. Some Parties presented their reporting according to their national priorities for climate-related research and observation activities, while others used the structure provided in the UNFCCC reporting guidelines on NCs. As regards the timeline of activities, several Parties reported on past research activities, which may have been included in previous national communications, while other Parties provided information that covers plans and programmes that will take place in the future. See box 5 for new developments that took place since NC5s.

Box 5

New developments since the fifth national communications

Several Parties highlighted a strong and increasing demand for research supporting government strategies and policies relevant to climate change. Parties also highlighted increases in efforts to make information available free of charge to a wide range of public and private users and providers of scientific information on climate change.

Many Parties further highlighted the need for new, multidisciplinary approaches to solve the research challenges associated with climate change over the next decades. Research collaboration has resulted in advances in the modelling of the complex processes part of global climate models, including in the areas of biogeochemistry, cloud and aerosol processes, and the inclusion of ice sheet model components.

Energy-related research and information on the transition to a low-carbon economy is another priority area highlighted, with advances in the funding of sustainable energy and technology research and development reported by many Parties.

Social and economic dimensions and the behavioural aspects of decision makers and private and public actors participating in climate change adaptation and mitigation were highlighted by Parties as new, emerging areas of research.

Parties acknowledged several advances in improving the availability of climate data and the development of new infrastructure for global observation systems, services and products, including through enhanced international cooperation.

Progress in the area of observation is noticeable in relation to the following: the global carbon cycle, including sinks and sources of greenhouse gases; oceanic

essential climate variables and the cryosphere; and various parameters in the polar regions, including the permafrost and the carbonate system, to support research on ocean acidification in the Arctic.

B. General policies and funding

37. Many Parties reported that they are enhancing the coordination of their research activities with a view to gaining better value from their investments in research, for example by: transferring knowledge across a wide range of scientific disciplines; identifying research synergies and knowledge gaps; and fostering national and international networks.

38. Information on the role of interdisciplinary research and the provision of scientific information to guide policy and decision-making on climate and global environmental change and developmental issues was enhanced in the NC6s compared with in the NC5s. In addition, Parties reported that the funding of climate change research activities is often the shared responsibility of multiple departments within the government. While several Parties maintained their focus and reported increased contributions from the private sector to research relevant to mitigation options, in particular energy-related research and information on the transition to a low-carbon economy, other Parties noted that their public and private sectors are increasingly contributing to the funding of research activities relevant to climate impacts and adaptation. The majority of Parties also reported on participation in international initiatives funded by regional and global research programmes and organizations active in climate change research and their contributions to the assessments of the Intergovernmental Panel on Climate Change (IPCC).

39. In addition to highlighting government strategies and focus areas for climate change research, many Parties reported that the majority of research activities are carried out by universities and other higher-education bodies, and that much of the basic research is funded directly from their allocated general budgets. Funding mechanisms created to support research relevant to climate change by higher-education bodies include the provision of research grants and the funding of research chairs to achieve excellence in chosen scientific disciplines. The establishment and use of knowledge centres in support of policy processes and decision-making has been reported on in Parties' NC6s more than in their NC5s. Box 6 presents some examples of policies and funding reported in the NC6s.

Box 6
Party-specific examples of policies and funding

Canada reported on the establishment of a framework to support policy processes, on cooperation between government bodies and academia, and on programmes to provide support for key activities and their long-term continuity. Examples include research grants for climate change research, networks of centres of excellence, research chairs for achieving research excellence in chosen scientific disciplines, and international initiatives addressing significant scientific challenges.

The United Kingdom of Great Britain and Northern Ireland and several other Parties highlighted improvements in climate information, including tools and climate services, for a range of users for increasing resilience to climate variability and change. For example, the United Kingdom's Met Office Avoiding Dangerous Climate Change programme has provided key results that have informed the Government's policy on climate change, including with regard to the peaking of emissions in the context of limiting warming to 2 °C and the technological and

economic feasibility of the transition to a low-carbon economy.

Several Parties, including the United States of America, emphasized activities and strategies for energy technology innovation, including clean energy technology and energy end-use efficiency.

40. Several Parties reported an increase in expenditure on research and development (R&D) activities compared with the data reported in their NC5s, though some reported on difficulties in increasing their R&D expenditure over the past few years following the economic recession. Pressures on public spending have in some cases affected the availability of funding for science and research programmes. Yet, some Parties reported that sustained or increased funding for R&D has been used to promote economic growth in the long term. Focus areas include R&D relevant to sustainable technologies and research relevant to energy efficiency, renewable energy and other energy-related research areas.

41. Some Parties are coordinating all funding provided by the government through a single coordination unit. Many Parties provided information on funding allocated to research activities in total as a percentage of gross domestic product (GDP), as well as an estimate of the share allocated to climate change related research activities, but several Parties also included information on the total budget spent on research activities only. The reports including the ratio to GDP show a large variation in overall R&D expenditure: while some Parties reported values of below 0.5 per cent of GDP being spent on R&D, several reported expenditures of around 2 per cent of GDP, and up to 3 per cent in one case. Several Parties reported that the share of overall R&D expenditure allocated to climate change research activities has increased. Parties also reported specific figures provided through different funding mechanisms and gave estimates of the funding directed to research that is relevant to climate change. However, Parties' different approaches to reporting make it difficult to compare their efforts in this regard.

C. International and regional cooperation, including capacity-building

42. Many Parties reported on the enhanced international coordination of climate change related research activities, which is seen as a way to strengthen economic and industrial competitiveness, tackle global societal challenges, such as food security and climate change, and ensure the availability of a reliable scientific basis for policymaking. Areas where greater cooperation is viewed as critically important include:

(a) Observations of the Earth, including satellite and in-situ observations, for monitoring global change and understanding its key processes;

(b) The development, testing and application of models with a view to enhancing the understanding of future changes and the possibility of reaching the tipping points in the Earth's system;

(c) The assessment of climate change impacts;

(d) Shared information on needs for adaptation and mitigation;

(e) The communication of scientific findings to diverse audiences.

43. As examples of international cooperative efforts, several Parties referred to their contributions made to international climate-science assessments, in particular to the work of the IPCC, including its Fifth Assessment Report and special reports, and highlighted their importance as mechanisms to convey information to decision makers. Other examples include: assessments provided by the Arctic Council's Arctic Monitoring and Assessment Programme; the annual State of the Climate reports led by the National Oceanographic and

Atmospheric Administration (NOAA) of the United States; and assessments relevant to adaptation.

44. In addition, many Parties are involved in the activities of global change research programmes, including the World Climate Research Programme, the International Geosphere–Biosphere Programme, the International Human Dimensions Programme, DIVERSITAS and the Global Change System for Analysis, Research and Training; and, more recently, in activities as part of the new Future Earth initiative.

45. Other examples of international efforts to advance cooperation include the implementation of the Global Framework for Climate Services (GFCS) and the strengthening of its underpinning components, such as modelling and observations, in support of science-based climate prediction and services.

46. Regional research activities in which many Parties participate, contribute to and provide support include: the European research initiatives, such as the Framework Programmes for research and the Joint Programming Initiative Climate; the Asia-Pacific Network for Global Change Research; and the Inter-American Institute for Global Change Research.

47. Several Parties reported on enhancing the broad and collaborative research on, and monitoring of, the climate through integrated research networks that are established to support such activities. Examples of such collaborative activities include: research projects for understanding the Earth system's processes; advancing weather, climate and environmental prediction; and understanding recent changes in the polar regions.

48. Capacity-building activities in developing countries aimed at generating and increasing knowledge on climate change and know-how and promoting the establishment of multidisciplinary research environments were reported by Parties, including on assistance to build capacity for research and systematic observation. A variety of cooperation activities implemented through bilateral and international programmes and projects and regional cooperation were highlighted, including in specific thematic areas, such as early warning and disaster risk reduction, climate services and meteorological forecasts, climate observations, networks and monitoring systems, regional information, sustainable development and management, institutional capacity, climate policy and others.

D. Research

49. The improved delivery of reliable scientific information and the promotion of public awareness and understanding of climate change through research are important priorities highlighted by many Parties. Several Parties highlighted specific priorities for improving the understanding of national vulnerabilities, for example in the areas of agriculture, forestry and ecosystems, and the regional impacts of climate change, including better understanding of extreme events and the risks associated with them. Several Parties recognized the importance of investment in R&D activities relevant to innovation in order to support the transition to a low- or no-carbon society. Challenges reported by some Parties include the lack of coordinated policy at the national level between research activities and innovation needed to realize such a transition.

50. The following paragraphs provide further examples of areas for research reported by Parties as well as identified research gaps. Some Parties reported that detailed studies are being carried out in the areas of climate change modelling and the carbon cycle. This includes studies on the role of the carbon cycle, including sinks and sources of CO_2, and on the role of other biogeochemical cycles. Other areas highlighted by Parties include researching terrestrial and oceanic ecosystems and studies on atmospheric chemistry,

Several Parties reported on the development of regional climate models and the downscaling of global climate model outputs. Parties active in the development of global climate models reported on advances in the representation of the processes in such models, including: in the area of biogeochemistry, allowing better representation of feedback processes; the simulation of cloud and aerosol processes, allowing improved modelling of the effects of aerosols on clouds and climate as well as associated feedback loops; and, in some cases, the inclusion of ice sheet model components to provide a fully interactive and dynamic model of ice sheet melting and its contribution to sea level rise.

51. Research activities reported also cover adaptation technologies, including: exploring options for adaptation to climate change in cities through the exploitation of ecosystem services and blue-green infrastructure for storage; and the infiltration and evaporation of stormwater run-off, for buffering the urban heat island effect and for biodiversity support. Research on new technologies for the treatment of stormwater run-off and water reuse was also reported. Sustainable planning concepts are being developed with partners from Asia and Africa. Information on research activities related to impacts, vulnerability and adaptation was limited in the context of research and systematic observation, as in many cases such information was provided in other parts of the NC6.

52. Research to address the need for information and tools to cope with the impacts of climate change is a high priority for some Parties, which emphasized the importance of the development and delivery of operational climate services, including various tools providing information to meet society's needs. Examples of services already delivered include: the provision of historical weather and climate information; indexes linking vulnerability to climate change with concrete and urgent issues such as hunger and availability of food and health; the provision of expert advice to guide strategic investment; online services providing information, for example, on how the climate may change and guidance on carrying out climate change impact assessments; and the development of user-friendly tools, such as the 2050 Calculator developed by the United Kingdom's Department of Energy and Climate Change, which utilizes energy and emission data and shows the benefits, costs and trade-offs of different future pathways.

53. Many Parties recognized the importance of public perception and attitudes in addressing climate change and reported an increase in activities relevant to providing sufficient information to various stakeholders and the general public. The behavioural aspects of decision makers and private and public actors participating in climate change adaptation and mitigation is an area that Parties highlighted as a new, emerging area of research, informing policies, for example, on transport and energy consumption.

54. Parties identified gaps and needs relevant to research on climate change. Table 2 contains a summary of those research gaps, compiled according to the typology of research topics provided in the UNFCCC reporting guidelines on NCs.

Table 2
Key gaps identified by Parties relevant to climate change research

	Identified gaps in knowledge and research needs
Climate processes and climate system studies	Further refining the understanding of how the climate system works
	Fostering new research at the interface between the study of the physical climate system and the biological sciences
	Enhancing understanding of past climate trends and variability and their causes
	Research on oceanic and atmospheric chemistry

	Identified gaps in knowledge and research needs
Modelling and prediction	Further research on modelling future climate change
	Recognizing the interplay between climate change and other dimensions of global change, such as land-use change, the alteration of biogeochemical cycles, pollution and loss of biodiversity
	Regional climate modelling, predictions and projections
Impacts of climate change	Addressing gaps in understanding regional impacts of climate change
	Direct impacts of carbon dioxide on ecosystems
	Improving understanding of climate system extremes, thresholds and tipping points
	Assessing the vulnerability of sectors, regions and populations, and supporting the iterative risk management of those vulnerabilities through adaptation and mitigation responses
Socioeconomic analysis	Demonstrating how access to energy can be improved and how economies can grow while keeping carbon emissions low in the long term
	Consequences of carbon management activities
	Adaptation options
	Coordinating researchers from natural and social sciences to address societal concerns
	Improving the integration of the social, behavioural and economic sciences
	Community resilience and human health
Mitigation and adaptation technologies	Information and tools to enable coping with the impacts of climate change
	Ways to improve access to sustainable energy
	Enhancing carbon sequestration, including forest sinks and soil carbon

E. Systematic observation

55. Most Parties are involved in maintaining the operations of the global observing systems, especially within the framework of the Global Climate Observing System (GCOS), and all Parties provided information on systematic observation in their NC6s. The degree to which Parties adhered to the "Revised UNFCCC reporting guidelines on global climate change observing systems"[3] and the provision of detailed technical reports on systematic observation in conjunction with the NC6s varied among Parties. Only a few Parties provided such detailed technical reports, either as a separate report or as an annex to

[3] Contained in the annex to decision 11/CP.13, which requested Annex I Parties to continue providing detailed technical reports on systematic observation in accordance with the provisions of decisions 4/CP.5 and 5/CP.5 in conjunction with their national communications. In addition, the Subsidiary Body for Scientific and Technological Advice, at its thirty-third session, encouraged Parties, when reporting on systematic observation in conjunction with their national communications, to take into consideration the new requirements identified in the 2010 *Update of the Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC*, in particular the new essential climate variables (FCCC/SBSTA/2010/13, para. 44).

their NC6, namely Denmark, Germany, Greece, New Zealand and United Kingdom. Finland referred to its report provided to the GCOS secretariat; and Austria and Switzerland reported on providing such reports through their national GCOS offices. Australia referred to an annex for the provision of data regarding atmospheric, ocean and terrestrial essential climate variables (ECVs).

56. Parties took various approaches in providing the required information on programmes, networks and/or systems that they are operating to provide observations of atmospheric, oceanic and terrestrial ECVs, as well as on their contributions to GCOS and other global observation systems, including the Global Terrestrial Observing System and the Global Ocean Observing System. Several Parties provided detailed information on their national contributions to observations of ECVs through networks specified in the Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC, and a few Parties specified actions taken in response to the recommendations contained in that plan and the new requirements identified in the 2010 update of the plan.

57. Several Parties highlighted their participation in the activities of the Committee on Earth Observation Satellites and their contributions and provision of support to the Global Earth Observation System of Systems of the Group on Earth Observations.

58. When reporting on their observation networks, programmes and systems contributing to GCOS and the observation of ECVs in the long term, many Parties highlighted several advances made in improving the availability of climate data. Several Parties reported on the development of new infrastructure for global observation systems and services, including through enhanced international cooperation, and their efforts to organize access to multiple sources of data from Earth observation satellites and in-situ platforms, aimed at providing reliable and up-to-date information to support both adaptation and mitigation. Improvements in linking adaptation and observations were also highlighted in the context of the development and implementation of the various components of the GFCS.

59. While sustaining the operation of their in-situ observation and monitoring networks, many Parties reported on their participation in the space-based observations of ECVs. Major initiatives highlighted include the Copernicus programme (former Global Monitoring for Environment and Security programme) and its Climate Change service. They also include the activities of the European Organisation for the Exploitation of Meteorological Satellites; and the European Space Agency (ESA), including the ESA Climate Change Initiative for global monitoring of ECVs.

60. Further significant efforts to improve global climate observations necessary to identify the causes, status and impacts of climate change reported by Parties with space agencies include: the development and operation of the Greenhouse Gases Observing Satellite by Japan, contributing to strengthening the observation and monitoring of region-by-region absorption and GHG emissions; and the support provided by the United States through the National Aeronautics and Space Administration (NASA) and NOAA to a number of major satellite missions that provide sustained global observations of the land surface, oceans, atmosphere, ice sheets and biosphere. In addition, some Parties that are not satellite operators reported on the production and provision of global products using data acquired from satellite observations of the atmospheric, oceanic and terrestrial domains.

61. Areas where Parties saw progress in relation to systematic observation include: enhanced observations of the global carbon cycle, including sinks and sources of CO_2; enhanced observations of oceanic ECVs and the cryosphere; advances in monitoring various parameters in the polar regions, including new climate-relevant infrastructure, such as polar buoys; the development of a new service for the long-term systematic satellite monitoring of the cryosphere; and the provision of palaeoclimatological data, for example

to support studies on the correlation between changes in temperature and changes in atmospheric CO_2 levels in the past. Permafrost monitoring is another area where advances have been made in recent years, but at the same time there are potential challenges reported with regard to securing the long-term continuity of maintaining permafrost monitoring, as one Party reported that monitoring continues to rely on short-term funding projects. Another key area reported is the monitoring of the carbonate system in the Arctic seas to support research on the causes of, and trends in, ocean acidification in the Arctic.

62. Growing demands for monitoring were highlighted, for example with regard to vegetation, soil conditions and biological diversity.

63. Several Parties reported on activities for digitizing and rescuing historical data sets, including in developing countries, and making available climate observation data through international data centres, as well as their commitment to endorsing the data-sharing policies of the World Meteorological Organization. Many Parties are making historical climate and weather data and other climate data sets freely available to all users, for example on the Internet. As regards reporting on capacity-building in developing countries with regard to climate observations, several Parties reported such activities (see chapter III.C above). Several Parties highlighted regional efforts to enhance climate observations, data sharing and related capacity-building. Some Parties also highlighted their contribution to the GCOS Cooperation Mechanism to enhance the quality of climate-related observations, in particular in developing countries.

64. Problems reported with regard to the sustained provision of climate observations include the suspension of some observation activities owing to budgetary constraints. For example, Portugal reported on suspending activities within Global Atmospheric Watch and some other monitoring programmes contributing observations of ECVs since mid-2010. Some Parties also reported on the need for the modernization of their observation networks.

IV. Education, training, public awareness, public participation, public access to information and international cooperation (Article 6 of the Convention)

A. Overview

65. All Parties reported in their NC6s on the implementation of Article 6 of the Convention as called for in the amended New Delhi work programme (2007–2012)[4] and the Doha work programme (2012–2020)[5] on Article 6 of the Convention. While many Parties focused their reporting on education, training and awareness-raising activities, some Parties also provided detailed information on actions taken in the areas of fostering public participation in, and enhancing public access to information on, climate change policymaking and action.

66. The overall scope of the reporting on Article 6 related activities has increased from the NC5s to the NC6s, with some Parties significantly expanding the information provided in the relevant chapter in comparison with the information provided in other chapters.

67. The main activities and new developments reported in the context of implementing Article 6 of the Convention are highlighted in box 7.

Box 7

[4] Decision 9/CP.13.

[5] Decision 15/CP.18, annex.

Main activities and new developments regarding the implementation of Article 6 of the Convention

- Increased scope of reporting in comparison to the reporting in the fifth national communications
- Specific references made to the implementation of the amended New Delhi work programme (2007–2012) and the Doha work programme (2012–2020) on Article 6 of the Convention
- Collaboration with various stakeholders on non-formal and informal climate change education and awareness-raising activities
- Training for and with the private sector on energy saving and energy efficiency measures and low-carbon procurement policies
- Fostering low-carbon consumption patterns and lifestyles
- Increased use of online tools for awareness-raising activities, such as social media, online games and emission calculators
- Public participation in local, national and international climate policymaking
- Increased use of online platforms for ensuring public access to information
- International cooperation on climate change education, awareness raising and the development of low-carbon development strategies and plans

B. Education and training

68. In their NC6s most Parties highlighted climate change education as an essential component of their climate action and reported an increasing number and range of activities in formal, non-formal and informal climate change education. Climate change is now part of the official curricula at the preschool, primary, secondary and university levels in most Annex I Parties. While many Parties reported that climate change education is addressed as part of environmental education, some countries have included it as a stand-alone subject or across disciplines and increased its prominence in recent revisions to the curricula. Some Parties reported on the introduction of new university programmes and adult education courses with a specific focus on climate change.

69. Many Parties reported on the development and provision of new educational materials to teachers and students, including multimedia and e-learning tools. Denmark has, for example, introduced a computer game on climate change[6] for 13 to 16 year old students. Some Parties highlighted the Global Learning and Observations to Benefit the Environment[7] and Eco-Schools[8] programmes as good examples of effectively bringing climate science into the classroom.

70. Most Parties have supported non-formal and informal climate change education through the promotion of green school, green campus or community programmes. Such programmes include: the provision of financial or technical support for schools to improve

[6] Available at <https://www.experimentarium.dk/index.php?id=1001>.
[7] See <http://www.globe.gov>.
[8] See <http://www.eco-schools.org>.

their energy and water efficiency; the introduction of ecofriendly office and school supply goals; the exemption of teachers for a teaching period in order to act as environmental focal points and develop and implement environmental campaigns within schools; as well as tree-planting initiatives, theme days, educational games and exhibitions to promote environmental protection, essay writing and art contests. Some Parties have also supported community-based and student networks that focus on climate change education. Many of these programmes and networks aim to educate children and youth on climate-friendly behaviour through hands-on involvement, while also engaging their parents, the media, local governments and the private sector in climate action. Party-specific examples of educational activities are provided in box 8.

Box 8
Examples of educational activities reported by Parties

The United Kingdom of Great Britain and Northern Ireland reported on its Students' Green Fund, worth 5 million pounds sterling (GBP), which will support 25 projects undertaken by students' unions across the country in 2013–2014. Projects will range from training students to reduce energy bills and carbon emissions by undertaking environmental audits of student houses in the community, to Green Course Ambassadors supporting the embedding of education for sustainable development into the curriculum, and providing low-carbon transport for the physically disabled. All projects foster local community engagement, with a total of 82 supporting partners and GBP 1.4 million worth of match and in-kind funding secured. Collectively the projects in 2013–2014 are estimated to engage 352,000 students and save at least 4,000 tonnes of carbon dioxide per year. The Students' Green Fund aims to support students' unions in becoming hubs of sustainability at the heart of local communities.

The United Nations Decade of Education for Sustainable Development (2005–2014) was launched upon Japan's proposal. The Government of Japan coordinates a national implementation scheme for the Decade through an inter-ministerial mechanism and uses the United Nations Educational, Scientific and Cultural Organization (UNESCO) Associated Schools Project Network[a] as a base for promoting education for sustainable development, including climate change education. The number of UNESCO Associated Schools in Japan reached 647 as at October 2013. In November 2014 Japan will host the UNESCO World Conference on Education for Sustainable Development[b] to celebrate the success of the Decade and the launch of the implementation of the Global Action Programme on Education for Sustainable Development.[c]

[a] See <http://www.unesco-school.jp/eng/>.
[b] See <http://www.unesco.org/new/en/unesco-world-conference-on-esd-2014/>.
[c] See <http://www.unesco.org/new/en/unesco-world-conference-on-esd-2014/esd-after-2014/global-action-programme/>.

71. Some Parties reported that the implementation scheme for the United Nations Decade of Education for Sustainable Development (2005–2014)[9] provides a valuable framework for formal, non-formal and informal climate change education in the context of education for sustainable development and highlighted their activities in that context.

72. Training for the public and private sectors has been conducted by many Parties in collaboration with non-governmental organizations (NGOs) and private-sector entities, with a focus on fostering the implementation of energy saving and energy efficiency measures, low-carbon urban planning, transport and construction practices, fuel-efficient driving, low-carbon procurement policies and ecotourism.

73. Some Parties reported on advancements in technical and vocational education and training towards creating green skills and green jobs in the areas of renewable energy, energy efficiency, energy auditing, and the development and deployment of environmentally friendly technologies.

C. Public awareness, public participation and public access to information

74. All Parties reported on having carried out awareness-raising activities on climate change related issues. Many Parties reported on activities that went beyond the objective of

[9] See <http://www.desd.org>.

simply providing information about the causes and adverse effects of climate change to encouraging the public to take concrete climate action.

75. Parties ensured the broad dissemination of information on climate change and on possible actions to address its adverse effects through, inter alia, websites, radio and television programmes, newsletters, direct mail, publications, social media, web blogs, movies, video games, online games, advertisements, posters, exhibitions, conferences, seminars, lectures, environmental awards, theatre, and days, weeks and months of action. Awareness-raising activities have been organized both by individual government entities as well as jointly with United Nations organizations, NGOs, youth groups, the private sector and the media. Some Parties reported on the provision of financial and technical support to NGOs, educational institutions and students for awareness-raising activities.

76. A focus of many awareness-raising activities was the provision of information on the direct and indirect GHG emissions from the production and use of goods, services and lifestyle choices in order to give consumers and the private sector a basis for well-informed decision-making, while encouraging behavioural changes towards achieving low-emission consumption and production patterns. Many Parties have developed and promoted advisory platforms and networks as well as online carbon calculators that allow for the measuring of carbon emissions and provide concrete proposals on how to reduce emissions through, inter alia, energy- and fuel-saving measures, waste management and the purchase of products or services that bear a low-carbon label. Some Parties have introduced low-carbon procurement policies at the local and national levels. Party-specific examples are provided in box 9.

Box 9

Examples of awareness-raising and public participation activities reported by Parties

The European Union's latest public communication campaign on climate change, entitled "A world you like. With a climate you like", in 2011–2012 focused on practical solutions to climate change by highlighting that the transition to a low-carbon society is not only urgent but also feasible and affordable and will enhance our quality of life. The campaign showcased and promoted dialogue on existing solutions applied by citizens, businesses and governmental authorities across the European Union in the areas of travel and transport, production and innovation, building and living, shopping and eating, and reuse and recycling. The campaign's interactive website was available in 23 languages.

Australia organizes regular meetings around the country to engage local communities in discussions on governmental initiatives and policies. One example is the development and implementation of the national Clean Energy Future Plan.[a]

[a] See <http://www.climatechange.gov.au/reducing-carbon/carbon-farming-initiative/carbon-farming-initiative-handbook/clean-energy-future>

77. An increasing focus on raising awareness of adaptation issues, in particular with regard to extreme weather events, was reported by some Parties.

78. A number of Parties measured an increase in public awareness of climate change through public surveys. Other Parties reported a decline in the media coverage of climate change related issues since the United Nations Climate Change Conference in Copenhagen in 2009.

79. Many Parties highlighted the importance of broad public participation in climate change policymaking and action. Some Parties reported on participatory processes for the preparation of local and national strategies, policies and programmes on climate change,

Among the reported measures taken to solicit the views of the public are community forums, online consultations and votes, public hearings, conferences, seminars, radio and television discussions and the participation of civil-society representatives in local and national advisory councils and in national delegations to the UNFCCC negotiations.

80. The importance of public access to information on climate science and the development and implementation of policies and actions that are related to climate change is widely recognized by Parties. Some Parties reported that their legal frameworks guaranteeing the right of public access to environmental information, including information related to climate change, are guided by the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters.[10] Many Parties have developed, with civil-society representatives, a variety of means to ensure public access to information on climate change related issues, such as through websites, information centres, service desks, newsletters, publications, radio and television programmes, conferences, seminars and workshops.

D. International cooperation

81. Parties reported on international cooperation with developed and developing countries as well as with the private sector on the implementation of Article 6 of the Convention. Some Parties reported on the provision of support to developing countries for the preparation and implementation of national low-carbon development strategies and programmes as well to youth, civil society and media representatives from developing countries to participate in the UNFCCC process.

Box 10
Examples of international cooperation activities reported by Parties

Between 2007 and 2012 Sweden supported information campaigns in developing countries with the aim of "boosting knowledge of the causes and effects of climate change" by targeting leading positions in national or local public governments, non-governmental organizations, universities and the private sector. During that period more than 440 participants from about 50 developing countries took part in the campaigns.

Italy reported on the "Educate for the Future" project, aimed at promoting and disseminating knowledge on sustainable development and enhancing the participation of Italian schools in the implementation of development cooperation projects with African countries on issues such as energy, environment, biodiversity, climate change, new technologies and responsible consumption. The project fostered partnerships between African and Italian schools and collaboration among students.

82. Many Parties have cooperated in the areas of education and research, including through the creation of international networks through the United Nations University Regional Centres of Expertise on Education for Sustainable Development,[11] which are hosted by higher-education institutions and involve local and municipal authorities, local communities, NGOs and the private sector.

83. Some Parties have collaborated with international business networks that work to reduce emissions from the business sector and raise awareness of climate issues by showing that ambitious climate strategies afford business advantages and greater profitability.

---

[10] Available at <http://www.unece.org/env/pp/treatytext.html>.

[11] See <http://archive.ias.unu.edu/sub_page.aspx?catID=1849&ddlID=183>.